

A PRACTICAL GUIDE TO DRILLING A WELL IN ARIZONA

The Arizona Department of Water Resources administers the Groundwater Management Code, a comprehensive regulatory mechanism that governs the use of groundwater.

Accordingly, ADWR regulates all groundwater wells in Arizona. Well regulations are vital to the proper management and protection of our groundwater. The well construction standards contained in the Code help prevent contamination of your well and the surrounding groundwater.

BEFORE DRILLING A WELL

First, will your planned well be located in one of the five Active Management Areas (AMAs)? In these areas, strict regulations govern groundwater use. The five Active Management Areas - Phoenix, Tucson, Pinal, Prescott and Santa Cruz- are shown on the map below. Generally, These areas are defined by groundwater basins and not the political boundaries of cities, towns and counties. Contact ADWR if you are not sure whether your proposed well is located within an AMA.

Next, will your well be exempt or non-exempt. Regulations differ depending on the type of well. Generally, exempt wells are less regulated than non-exempt wells.

An exempt well has a maximum pump capacity of 35 gallons per minute. Typical uses include non-irrigation purposes, noncommercial irrigation of less than 2 acres of land, and watering stock. Most exempt wells are used for residences and are more than adequate for household use. In AMAs, new exempt wells used for non-residential purposes can withdraw a maximum of 10 acre-feet per year.

A non-exempt well has a pump capacity exceeding 35 gallons per minute. This type of well is generally used for irrigation or industry. Because non-exempt wells may be subject to special requirements, you should contact ADWR for more information if you are planning to drill a non-exempt well.

Now, you are ready to choose a well driller and apply with ADWR for authority to drill. There are two types of applications for drilling authority:

- A Notice of Intention to Drill form (NOI) must be filed for all wells outside AMAs and exempt wells inside AMAs.
- An Application for a Drilling Permit is required for non-exempt wells inside AMAs.

THE APPLICATION PROCESS (NOTICE OF INTENT TO DRILL - NOI)

Before installing a new well, you must receive authority to drill from ADWR and file information explaining how the well will be constructed. Most people will need to file a Notice of Intention to Drill form (NOI). The application procedure includes the following steps:

1. Submit a Notice of Intention to Drill (NOI)

The information you need to furnish with the NOI includes:

- your name, address and telephone number
- county assessor's parcel identification information
- the location of the proposed well by legal description
- a description of the proposed well to include an explanation of how you intend to use the water from the well
- the name, address, and license number of the well drilling firm

Payment of filing fees will also be necessary when you file your NOI. Please note, processing an NOI takes at least two weeks.

If the well is intended for non-domestic purposes as defined in Title 45-454, or it will be used for domestic purposes and the size of the property upon which the well will be constructed exceeds 5 acres, the NOI shall be filed with the Director of Water Resources.

If the well is intended for domestic purposes as defined in Title 45-454, and the size of the property upon which the well will be constructed is less than 5 acres, the NOI and site plan must be submitted to the county or local health authority to ensure compliance with well siting and septic tank separation requirements. File the NOI in duplicate with a site plan. The site plan must:

- Include the county assessor's parcel identification number
- Show the proposed well location and location of any septic tank or sewer system that is either located on the property or within one hundred feet of the proposed well site.

If the proposed well location meets State and local requirements, the health authority will then forward the NOI to ADWR for review.

If the health authority can not determine whether the proposed well location complies with State and local requirements, it makes a note on the site plan and on the NOI and forwards the copies of the NOI and site plan to ADWR for review.

If the various factors prevent the well from being drilled in accordance with State and local requirements, the property owner may apply for a variance. You may request a variance from ADWR, or the county or local authorities, depending on the steward of the legal element that prevents the well from being drilled.

Filing a Notice of Intent automatically registers your well. Well registration benefits water users in the following ways:

- Well registration serves as evidence of your historical claim to use groundwater.
- Helps with notification if groundwater becomes contaminated in your area.
- ADWR can protect your well when granting permits for new wells in an AMA. (A concentration of wells can adversely affect well yields.)

2. Receive Authorization to Drill

ADWR will give your well driller a drilling card authorizing the drilling of your well. This card must be in the well driller's possession before drilling can begin and at all times during the actual work. The card lists the drilling firm, the license number, and the location of the well. The drilling firm listed on the card must be the firm that constructs your well. Once the card has been issued, selecting another drilling firm will require that a change of driller request form be submitted to ADWR, along with a filing fee.

3. Complete the Well Driller's Report

The driller must complete a well driller's report, including a well log. The well log contains information that will be important when doing work on your well in the future. The information required includes:

- the depth of the well
- the depth to the water
- the type and size of casing, and
- the kind of material used in well construction.

While the well is being constructed, you should check the driller's records to make sure that the casing length, well depth, and well yield test results are reported accurately. (The well yield test determines the quantity of water your well can produce.)

4. File the Completion Report

You must file a Completion Report within 30 days of equipping the well with a pump. There is not a time limit for completing pump installation but you cannot leave a drilled hole open. ADWR will mail the Completion Report forms to you after you file a Notice of Intent. Your pump installer should be able to help you complete the report. The information you need for this report includes the type of pump installed, the pump capacity, and the results from the well yield test.

LOCATING A WELL

An important factor to consider when constructing a well is where to locate it. You will probably want to put your well close to where you will use the water and close to a power source. This will reduce your construction and energy costs. To protect the quality of your water, the state has adopted rules about well location. All wells must be at least 100 feet from septic tanks or sewage disposal areas. Check with your neighbors to make sure your proposed well is at least 100 feet away from their septic systems. It is preferable to locate a well uphill from septic systems and as far away as

practical. Before drilling you should also check to see if your county health department has additional regulations affecting well location.

Here are three recommendations about locating your well:

1. It is important to direct surface water drainage away from your well. If it is located on a hill, divert the up slope drainage around or away from the well. It is preferable not to drill your well in an area that floods. If you must, take extra precautions to protect it, such as installing a pitless adaptor which allows you to pump and pipe water under the ground.
2. You should leave enough room around your well for easy access during drilling, maintenance, repair and testing.
3. It is preferable to locate your well as far away from neighboring wells as possible. Wells that are close together can interfere with each other, producing less water. You can contact ADWR's Water Rights Records Section to find the locations of other wells in your area.

CHOOSING MATERIALS AND EQUIPMENT

Factory-made equipment and materials should be used if you want a good quality well.

A factory-made perforated casing or well screen is especially important, since a poorly made perforated casing or well screen may permit sand or mud to enter the well, or not permit enough water into the well for it to work properly. The pump is a very important component of the well system and should be selected carefully. The pump size should be based on the well casing size and the quantity of water needed. If you choose a pump with a capacity greater than the well yield, you may get muddy or sandy water or the well and pump may fail. When selecting a pump, choose a design that will produce enough water yet will keep energy use to a minimum. Consult with your pump installer to select the best equipment for your needs. When installing new pump equipment, be sure to obtain a copy of the warranty covering the pump.

Many well owners opt for systems to store water pumped during times of low demand. A storage system will allow you to meet your peak water demands if your pump capacity is not sufficient. A pump installer can help you plan a system that incorporates water storage.

SELECTING A WELL DRILLER

You may wish to talk with several drillers before selecting one. When talking with drillers, ask for the names of former customers in your area. Find out if they were satisfied with the driller's work.

You should also ask the driller questions about the work that will be completed and the payment of fees. Will you receive a written agreement or contract that spells out an understanding of the work to be done? Does the contract include all the details and costs (including materials) of the well construction? A written contract can help avoid costly misunderstandings.

Make sure the driller you intend to hire is licensed. All well drillers must be licensed by both ADWR and the State Registrar of Contractors (ROC.) You can find out if a specific driller is licensed by contacting ADWR or the Registrar of Contractors. The category of license required by the ROC for residential or domestic water wells is a C-53.

Before signing a contract with a well driller, you should read it carefully to make sure it includes:

- a cost estimate, including materials and labor charges
- a target date for completing the well
- detailed well specifications, such as diameter and depth
- specific information about the surface seal
- the driller's plans for developing the well
- the method to be used for the yield test
- the kinds of materials to be installed, such as the type and quality of casing; the drive shoe, if necessary; the type and quality of well screen; the pump (if your driller is providing the pump); and all other pieces of equipment
- procedures and costs for abandoning or permanently closing the well if it cannot be used

CHECKING WELL INSTALLATION

There are four major steps involved in constructing a well:

1. drilling the hole
2. installing the casing
3. well development; and
4. pump installation or capping.

You should monitor your driller's work throughout construction. Make sure your well is equipped with a proper surface seal as required by Arizona's well construction rules. A proper surface seal consists of a steel casing extending from one foot above ground level to a depth of 20 feet surrounded by cement grout. The grout is used to seal the casing so contaminants cannot enter the well from the surface. The state has established a minimum standard of 1.5 inches of cement grout poured in the space between the borehole wall and the casing in one continuous application from a minimum depth of 20 feet to the land surface.

Make sure your driller properly develops and disinfects your well. Well development involves removing the drill cuttings and drilling materials from the well to make the water suitable for use. A well that has been properly drilled and developed should produce water free of sand and mud. To disinfect a well, chlorine must be added. Various methods can be used to do this. However, with any procedure the concentration of chlorine in the well should be at least 50 milligrams per liter. This work should be performed by your licensed driller.

Once drilling is completed and the rig is moved off the site, your well must be protected by covering the drill hole to prevent contaminants from entering the well and to help prevent water waste. This requires either installing a pump or sealing the well with a watertight cap. Upon completion of drilling and removal of the drilling rig, the well must be in one of the following conditions:

- equipped with a pump
- capped, or
- abandoned

Capping will not prevent you from using your well later. Abandoning your well means to take it out of service permanently. Usually, a well is abandoned because it does not produce sufficient amounts of water or it produces poor quality water. Procedures for abandonment are discussed later.

KEEPING YOUR WELL SAFE

After well construction is completed and the surface seal is in place, a few simple steps will help keep your well in safe operating condition. Before you use your well for drinking water, you should have the water analyzed for bacteriological and chemical qualities. Independent laboratories can perform these tests. It is also good to have your water analyzed for bacteriological quality each year and for chemical quality every three years. Changes in water quality could indicate defects in the well system.

Protecting the quality of your water is extremely important. Do not store poisons, pesticides, or other hazardous materials in your pump house or near your well. An accidental spill could contaminate the well and the aquifer. Never use your well as a place to dispose of anything. You should keep records of all work done on your well. If you lose your well records, ADWR's Water Rights Record Section can give you copies of the documents that have been filed on your well.

ABANDONING A WELL

When it becomes necessary to abandon a well, you must follow ADWR rules regarding well abandonment. Well abandonment shall be performed only by a licensed well drilling contractor or a property owner who has obtained a single well license from ADWR. The owner of a well shall file a Notice of Intention to Abandon a Well form (NOIA) prior to

abandonment, on a form prescribed and furnished by the Director. Upon receipt of a proper NOIA, the Director shall mail a well abandonment card to the designated well drilling contractor or single well licensee. Only at that time may the well drilling contractor or single well licensee commence abandonment of a well.

The abandonment of the well shall be accomplished through filling or sealing the well so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water. The well shall be filled from the bottom to a depth of 20 feet with cement grout, concrete, bentonite, clean sand with bentonite or cuttings from the well. A cement grout plug shall be set from the top of the well to minimum of 20 feet below the land surface and the annular space outside the casing (if applicable) shall be filled with cement from the land surface to a minimum of 20 feet below the surface. Materials containing organic or toxic matter shall not be used in the abandonment of a well.

The well drilling contractor or single well licensee shall notify ADWR in writing no later than 30 days after abandonment has been completed. The notification shall include the well owner's name, the location of the well, and the method of abandonment.

FREQUENTLY ASKED QUESTIONS

Here are some frequently asked questions about wells. If you have additional questions, contact ADWR for more information.

Q: May I have two wells at my house?

A: Under some circumstances. If you are outside an AMA, there are no restrictions on the number of wells you may construct as long as the water is put to reasonable and beneficial use. Contact ADWR if you are unsure whether your well is located outside an AMA.

Within the AMA, you cannot have two exempt wells serving the same purpose at the same location. You may use two exempt wells for different purposes.

If you wish to drill additional non-exempt wells within an AMA, contact ADWR to find out what restrictions apply.

Q: How much should a well cost?

A: The cost of a well depends on its size, depth, and location. It is good to compare estimates from several drillers to be sure you are getting the best value for your money. Remember, the lowest price may not be the best deal.

Q: How do I find a qualified well driller?

A: ADWR cannot recommend a specific well driller. However, ADWR and the Registrar of Contractors can tell you if a driller is licensed and in good standing.

CONTACTS

Arizona Department of Water Resources

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Phoenix, AZ 85004-3903 (602) 417-2400

- Groundwater Management Support Section: (602) 417-2470
Primary point of contact for questions pertaining to the filing of Notice of Intention to Drill (NOI) forms, well construction and the licensing of well drillers
- Water Rights Records Section: (602) 417-2405

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